

PREPARING W



SUCCESSFUL

BY SUSAN REESE

If there is any doubt that career and technical education (CTE) has an important role to play in preparing our nation's future workforce, consider these statistics from the 2010-2011 edition of the *Occupational Outlook Handbook* of the U.S. Bureau of Labor Statistics. Of the 20 fastest-growing occupations, half are related to health care, and two of the fastest growing are in the computer specialist occupation group. Office and administrative support, education, sales and food service also make the list. And of the 20, 12 fall in the associate degree or higher category.

In these and other occupations, education and training are becoming

even more critical. According to the Air Conditioning and Refrigeration Institute (AHRI), in order to become an air conditioning journeyman, which is the first step in becoming a qualified technician who can perform service calls, an individual must complete 144 hours of classroom instruction per year and 2,000 hours of on-the-job training in the field every year for a minimum of three years. And, with HVACR equipment continuously becoming more sophisticated, training must be ongoing throughout a technician's career.

In an open letter to the president and Congress that the organization posted on its Web site recently, the National Automotive Technicians Education Founda-

tion (NATEF) stated, "The globalization of business and industry requires workers with core knowledge and skills that can be applied—and quickly upgraded and adapted—in a wide and rapidly changing variety of work settings. There continues to be a strong demand and an inadequate supply of employees with these skill levels." NATEF also noted of CTE that, "CTE supports strong economic competitiveness by helping secondary and post-secondary education programs increase student engagement, improve math, science and literacy skills, meet America's workforce needs, and meet employer demands for highly skilled workers."

Both AHRI and NATEF are Associa-

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IN CAREERS

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tion for Career and Technical Education (ACTE) National Affiliate Organization members, and both understand the importance of CTE in ensuring their industries have a well-prepared workforce. The National Association of State Directors of Career Technical Education Consortium, another member, notes in "CTE: Education for a Strong Economy" that, "CTE programs provide the skills and training that addresses the needs of high-growth industries such as health care, renewable energy and STEM fields."

Hands-on training is an important element of the CTE classroom, and when that occurs in an actual workplace setting, it may be called internship, apprentice-

ship or cooperative education. Whatever term is applied, it is another way in which CTE is preparing the new workforce.

Preparing Automotive Technicians in Maryland

Parkside High School in Salisbury, Maryland, is among the programs with NATEF certification. Since it opened in 1997, it has received numerous awards, including the 2008 ACTE Award for Excellence, a joint effort of ACTE, Automotive Service Excellence (ASE) and the Automotive Industry Planning Council (AIPC). In 2006, the program was recognized by Automotive Youth Educational Systems (AYES) as the top program for

the state of Maryland and one of the best in the country.

During the three-year course of study, students learn about the systems and components of today's complex automobiles, and master the tools and techniques necessary to repair and maintain them. The program of study at Parkside stresses developing and practicing safe and efficient work habits, positive work ethic practices, customer relations skills, and communications skills—both verbal and written.

Students who complete the proper requirements of the program may earn college credits through articulation agreements with postsecondary institu-

tions—up to nine credits at Delaware Technical and Community College and/or 10 credits at Catonsville Community College. In addition to the academic curriculum taught in the classroom, the students also get hands-on training at the school, as well as through job shadowing opportunities and internships at local automotive shops and dealerships so that they develop real-world skills needed by today's employers.

"It is extremely important that an automotive training program provide both hands-on as well as classroom training," says instructor Dave White. "I repeatedly tell my students that the toughest part—and 90 percent of what it takes to repair one of today's modern automobiles—is the correct diagnosis of the problem. Much of learning how to perform this diagnosis is taught in the classroom through the teaching and development of a good diagnostic strategy, learning how to use computerized shop manuals to find component locations and TSBs (Technical Service Bulletins), as well as making sure the

student has a clear understanding of the theory behind how components function and interact with other parts and systems within the vehicle. We have found that we spend about 35 to 40 percent of our instructional time with the students in the classroom, with the remainder of our time being spent in the shop completing the required NATEF competencies and doing live customer work that provides a realistic shop type experience for the students."

There are about 20 locations where Parkside students do their job shadowing and internships. According to White, approximately 14 of these are dealerships, and the rest are independent shops. "We ensure all of the locations are a well-established business that is known for having a good relationship with their employees and a good reputation for customer service," he adds. "All of the locations have mentors who are assigned to the students and who monitor and evaluate their work as well as assist in training while at the job site."

White notes that the program utilizes

the AYES model for its internships and job shadowing programs, with a few modifications that they have put in over the years that they find work best for their students and employers.

"We tell prospective employers, parents and students that our internship program is our 'career test drive.' The internships allow our students to see firsthand at an early point in their life if a career in automotive technology is right for them," White notes. "If it is, they gain valuable work experience, earn money and can quickly get a snapshot of what their future career in automotive technology may look like."

White has found that employers like the internship program because they get to see and learn about a future long-term employee. They quickly find out about the work habits and skills that the students have acquired and can make an informed decision as to how much time and money they wish to invest in the prospective employee. As White explains, "Most of our employers use the 'grow your own approach' for acquiring new technicians at their locations, which makes our program a perfect fit for them."

A New Health Care Workforce in Florida

In the Pre-Medicine and Allied Health Professions Career Academy at Lake Worth Community High School in Lake Worth, Florida, job shadowing in all areas of medicine provides unique opportunities for students, and for seniors there is an additional opportunity for participation in a clinical internship in a medical facility. The Lake Worth program, which has been cited by ACTE as an exemplary program, is designed to encourage and prepare students for entry into allied health professions, including allied health care assisting, nurse assisting, practical nursing, first responder, pharmacy technician and EKG aide. Started in 1991, and now one of the largest Medical Choice Programs in the country, the Lake Worth



▲ In the Lake Worth Community High School Pre-Medicine and Allied Health Professions Academy, uniforms, good attendance and GPAs are among the requirements for students.

"This is hands-on experiential learning, and these are
REAL-WORLD
 projects," says Craig Caldwell, chair of the Salt Lake
 Community College Biotechnology Department.

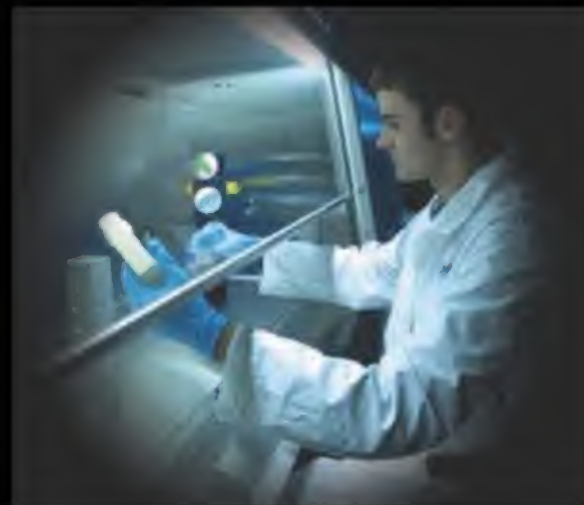


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program has received a Certificate of Recognition from Magnet Schools of America and the National Career Academy Coalition Award of Excellence. The National Healthcare Association recently approved a request by the school to become an official EKG testing site, making it the first high school testing site in the Palm Beach County School District.

All of those accolades help when it comes to placing students in internships and clinical experiences. "We've been blessed to have a good reputation and excellent support from our administration," says Department Chair Lauremi Fanego, who also notes that Principal Ian Saltzman and Assistant Principal Daniel Snider were recognized as Palm Beach County high school CTE principal and assistant principal of the year. "We have high standards and a great staff, so employers love to have our students as interns." For the students, she notes, "We have rules about everything from uniforms to attendance to GPAs. We want them to understand that this is a serious matter."

The students take Health Science 1 as a foundation course in their first year and learn about the body and its anatomy. That is followed by Health Science 2, which is an introduction to the medical field. The topics include safety, vital signs, infection control, CPR, legal issues, and medical careers. That gives them the foundation for Health Science 3, when they go to clinical sites to get practical experience. Through articulation

agreements the school district has with area community colleges, students who complete the program can skip certain introductory classes if they choose to continue their education at one of these local two-year schools.

Fanego notes that visits to clinical sites such as hospitals and nursing homes give the students the opportunity to explore careers. "They go to different departments, and it's a great way for them to see what's out there," she says. They also get the chance to operate equipment for a field they are interested in, especially at nursing homes. They perform a minimum of 20 hours at nursing homes. In addition to nursing homes, the students may go to hospitals such as JFK Medical Center or Bethesda Memorial Hospital, or to doctors' offices. The students get hands-on experience with patients, but before they visit any site, it is important that they are prepared and professional, and that's what the Lake Worth program is ensuring. "We give them the tools and the background, and we prepare them for the workforce," says Fanego.

An Innovative Internship in Utah

In Utah, biotechnology is taught as a CTE course in both high school and college. The course teaches basic lab techniques and their rationale. The topics covered in the first year biotech course include DNA isolation, DNA manipulation, protein isolation, protein manipulation, microbiology, genetics, forensics, and

bioinformatics. These topics are investigated in the laboratory using cutting-edge equipment and in the computer lab using Web tools and information. Students are responsible for performing independent laboratory experiments, preparing solutions, prepping samples, problem solving errors, analyzing data, and communicating results.

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Students earning credit in the entry-level classes can follow a pathway that takes them from high school onto a two-year degree program at Salt Lake Community College (SLCC), and onto a four-year degree at Utah Valley University (UVU). The high school biotechnology programs are located in several school

districts that neighbor SLCC, but the Jordan School District is especially close to the SLCC program; its biotechnology program is situated on the SLCC campus. The SLCC biotechnology program shares a facility with the Jordan School District as well as having laboratories in its recently opened Health Sciences Build-

ing on the campus. The Health Sciences Building includes an instrumentation lab, two fully equipped wet labs, a cell culture room and a prep room. The size and quality of the facility allow students to get hands-on experience with several advanced pieces of instrumentation that include DNA sequencers, robotics, real-time PCR (polymerase chain reaction), fluorescence microscopy, and others.

The Intro to Biotech and Intro to Biotech Lab courses can be taken by high school juniors and seniors through concurrent enrollment worth four credit hours. Students who take both as juniors can return as seniors to take the Biotech Experience class, which is an early research experience that is part of InnovaBio, a unique aspect of the SLCC program. InnovaBio is a unique partnership between local corporations and SLCC that supports Utah's biotechnology industry by providing flexible, industry-based research internship opportunities for students in high school, SLCC and UVU biotechnology programs. InnovaBio contracts projects for research and development as well as services for local companies, and student interns work in teams to conduct the work. The work is done in the SLCC biotechnology labs and supervised by the InnovaBio scientific staff. Students receive credible research experience and internship credit.

"This is hands-on experiential learning, and these are real-world projects," says Craig Caldwell, chair of the SLCC Biotechnology Department. Some of the companies that contract the projects are surprised to find that high school students are among the college students delivering the research and reports. "These high school students are more like seniors in college in their thinking and independence," notes Caldwell.

Working in the lab on campus means that the students are in a familiar setting and know where to find things. As Caldwell notes, this helps them feel comfortable in the research environment so



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they can focus on completing the research objectives for the companies. Students have the option to take part in this research experience early in their training. For those who choose this option, the early internship experience helps them develop independent thinking that sets them apart in their classroom learning.

Caldwell, who is really proud of the program and its students, shares this story: "One high school student gave a report to a company recently. The senior scientist and executive leadership that were in the room didn't find out until after her presentation that she was a high school student. They were stunned. They thought she was a graduate student."

"InnovaBio is the centerpiece of our internship program, and not many schools are doing what we're doing," says Caldwell. One that is, however, is Hagerstown Community College (HCC) in Hagerstown, Maryland. The biotechnology program at HCC recently worked with SLCC to replicate the program on its own campus to benefit both students and local biotech companies.

"Biotechnology is the technology of now, not tomorrow," says Caldwell, who worked in industrial research settings before coming to SLCC, and he adds, "CTE and academics are the hallmark of the 21st century. We need both of these together."

In Utah, and now in Maryland, they are coming together to provide a 21st century education for a 21st century workforce.

New Workforce for a New Field in Oregon

At Lane Community College (LCC) in Eugene, Oregon, the career and technical programs include water conservation technician and an energy management technician program with options for renewable energy technician and resource conservation management, but the school's green commitment brought a new program to the campus this year.

The sustainability coordinator program is designed to fill the workforce needs of this emerging occupation.

"We sent out questionnaires to sustainability coordinators in higher education institutions to help define the skill sets important for sustainability coordinators, and also looked at job postings for those positions and pulled out the key skill sets," says LCC Sustainability Co-op Coordinator Larry Scott. "That's how the program was designed."

The sustainability coordinator program is so new that Scott is just beginning to work on placing students into the first internships, but the other programs have well-established cooperative education opportunities. The energy management program includes six credit hours of internship, and the water conservation program has nine credit hours. According to Scott, many students do more and often use additional internships to fill elective requirements.

"We see internships as a key ingredient," Scott says. "In CTE we understand that the classroom only takes you so far. At some point you have to go out and use the knowledge you learned in the classroom."

There are many areas of opportunity in internships for students in the energy management program. Students work with utilities, commercial firms and government agencies. They may do installation, weatherization, auditing, analytical work or cost benefit analysis. They may work with the controls component or with building systems.

"There is a broad portfolio of career opportunities in the energy industry," notes Scott, "and it is expanding."

Very few students come to the energy management program at LCC right out of high school, according to Scott. Many have a two- or four-year degree, some have a master's, and there is even an occasional Ph.D. Some are changing careers or building upon an existing career. They come to a school such as LCC and

into a CTE program for a good reason.

"We train people to do jobs," says Scott. "We give them the skills to actually be employed, and we measure our success by how employable our students are."

When measured by that standard, CTE has to be judged a success in preparing the new workforce, whether it is for long-established occupations or new and emerging industries. **I**

Explore More

To learn more about the organizations and programs featured in this article, here are the Web sites to visit.

Air Conditioning, Heating and Refrigeration Institute
www.ahrinet.org

National Automotive Technicians Education Foundation
www.natef.org

National Association of State Directors of Career Technical Education Consortium
www.careertech.org

Lake Worth Community High School
Pre-Medicine and Allied Health Professions Career Academy
www.palmbeach.k12.fl.us/LakeWorthHS

Lane Community College
www.lanec.edu

Parkside High School
www.wcboe.org/schools/phs

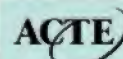
Jordan School District
www.jordandistrict.org

Salt Lake Community College
www.slcc.edu

InnovaBio
www.slcc.edu/innovabio/

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